



Short Communication

Impact of Prayagraj Kumbh-2019 on water quality and plankton communities of the river Ganga

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ABSTRACT

Anthropogenic activities put remarkable pressure on the ecological conditions and sustainability of many aquatic ecosystems. The present study was to understand the impact of mass bathing during a short period (two months) on the various physico-chemical parameters of water quality and planktonic fauna and flora of the river Ganga at Prayagraj. Dissolved Oxygen revealed sharp decline of oxygen in the downstream centre, after mass bathing. Chemical Oxygen demand, Total Dissolved Solids, Chloride and Specific Conductivity increased after every rain gradually. During mass bathing period reduction in Bacillariophyceae percentage and increase in Chlorophyceae was a prominent feature. On the advancement of mass bathing, increases in the number of planktonic groups as well as increase in number of taxa were recorded due to the increase in organic nutrients owing to anthropogenic activities. Palmer algal genera organic pollution index varied between 12 and 19 indicating medium pollution. COD was found to be significantly different between before and after mass bathing.

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INTRODUCTION

The Ganga is a holy, spiritual and national river of India. After originating from Gangotri, the river enters the plains at Haridwar, then passing through various cities of Uttar Pradesh, Bihar, Jharkhand, West Bengal and finally falls into the Bay of Bengal at Gangasagar. During the course of its flow, different right and left bank tributaries join it at different locations. The Yamuna river, a right-bank tributary, confluences with Ganga at Prayagraj (earlier known as Allahabad) forming Sangam (confluence-a sacred place) with mythological Saraswati river. At the interval of six years and twelve years, there is a huge congregation of people to take holy bath at this place known as Kumbh and Mahakumbh respectively. Last Kumbh was organized in Prayagraj during mid-January 2019 to mid-March 2019 to take a spiritual dip in the Sangam on five different bathing dates viz. Makar Sankranti (15.1.2019), Muni Amavasya (4.2.2019), Basant Panchmi (10.2.2019), Maghi Purnima (19.2.2019) and Mahashivratri (4.3.2019). It was estimated that more than 20 Crores people had taken bath during this Kumbh. On Muni Amavasya maximum crowd (more than 12 Crores) was present and participated in the bathing process. People stay here (near confluence) for a long

period as Kumbh Mela which completed in approximately two months. Human activities during this period may affect the river Ganga as anthropogenic activities put remarkable pressure on the ecological conditions and sustainability of many aquatic ecosystems (MEA, 2003). These activities not only increase the quantities of nutrients but also change forms and proportion of nutrients to the environment which can lead to adverse effects on water quality such as eutrophication and food web structure (Gibert, 2012). Any change beyond the limit of tolerance may affect the population of different organisms favorably or unfavorably, thus affecting the population of a species. Water quality of any river is also affected by mass bathing activity (Das *et al.*, 2014). If the fluctuation in parameters of an abiotic factor does not follow a particular pattern then it will be difficult for species to survive in such uncertain environments (Pati and Pati, 2012; Seniwai, and Aklaker, 2006). Human interference exerted tremendous strain on aquatic communities besides deteriorating water quality (Arora *et al.*, 2013; Kulkarni and Sharma, 2006). Algal flora and fauna either planktonic or periphytic are considered as an indicator of the aquatic